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CONTRIBUTIONS TO NORTH AMERICAN EUPHORBIACEAE—V

1. "EUPHORBIA ADENOPTERA" IN NORTH AMERICA.
2. CHAMAESYCEAE NOVAE.
3. NOTULAE HYPERICIFOLIAEARUM.

BY

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CHICAGO, U. S. A.

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CONTRIBUTIONS TO NORTH AMERICAN EUPHORBIACEAE—V*

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CHARLES FREDERICK MILLSPAUGH

1. "EUPHORBIA ADENOPTERA" IN NORTH AMERICA

M. Boissier, in his treatment of the species of Euphorbia in De Candolle's Prodromus, grouped all North American specimens that bore the vespertilloid involucral appendages characteristic of *Euphorbia dioica* Kunth under Bertoloni's *Euphorbia adenoptera*, retaining the latter name solely because Kunth's species proved to be monoecious.

In the light of a large amount of material collected since M. Boissier's consideration of the genus, it is evident that Bertoloni labored better than he knew, his *adenoptera* being good and in no way conflicting with Kunth's *dioica*. Herr Klotzsch, and later Herrn Klotszch u. Garcke saw with keen perception that there were several distinct species that bore a general likeness; these, however, M. Boissier did not recognize and so compiled his description of *adenoptera* as to include at least some characters of each.

Through the kindness of Dr. Engler, Dr. Prain, Dr. Casimir de Candolle and M. Beauverd, I have been granted the privilege of studying the types of *dioica*, *adenoptera*, *densiflora*, *inaequalis*, *Lindeniana* and other material from the herbaria of Kew, Berlin, Boissier and De Candolle; these, with the large series in the herbarium of the Field Museum and the specimens in the collections of the Missouri Botanical Garden, New York Botanical Garden, United States National Herbarium and the Gray Herbarium, Cambridge, all of which have been courteously loaned me, have rendered the following solution of the group possible.

The North American "*adenopterae*" resolve into eight clearly characterized species which may be summarized as follows:

*Contribution — I appeared in Proc. Calif. Acad. ser. 2, 2:217–230. 1889.
II " Pittonia 2:82–90. 1890.
III " Botanical Gazette 25:13–25. 1898.
IV " Botanical Gazette 26:265–270. 1898.

INVOLUCRAL APPENDAGES GLABROUS:

Seeds triangular ovoid:

Angles not tuberculate,

Sulci 4, closed, the two basal anastomosing, coat pitted; leaves serrate, hairs long, monocellular *dioica*

Sulci 5, closed to mere slits, distinct, coat farinose; leaves serrate, hairs cottony, multicellular *rutilis*

Sulci 5, shallow, concave, distinct, coat pitted; leaves entire, glabrous *inaequalis*

Angles tuberculate,

Sulci 4, open, coat farinose; leaves serrate, hairy especially beneath *indivisa*

Seeds ovoid:

Sulci 3, narrow, distinct; leaves fabiform, short crispid-hairy *adenoptera*

Sulci 5, broad, the two basal often anastomosing; leaves lanceolate, scatteringly straight-hairy *conferta*

INVOLUCRAL APPENDAGES HAIRY:

Seeds ovoid, sulci 6, closed to mere slits; leaves minutely crispid-hairy, stem hairs moniliform *densiflora*

INVOLUCRAL APPENDAGES WANTING:

Seed triangular-ovoid,

Sulci 4–5, closed, the dorsal transverse the ventral oblique; leaves oblong-ovate, crispid-puberulous *monensis*

These species are as distinct in their distribution as in their characters.

While the terminal species *adenoptera*, *densiflora* and *indivisa* are strikingly clear-cut and constant in their special regions, *dioica* is strongly mutational, hardly two specimens having been seen that exactly duplicate each other.

Chamaesyce dioica (Kunth) comb. nov.

Euphorbia dioica Kunth, H. B. & K. Nov. Gen. et Sp. 2:53. 1817.
Euphorbia ocymoides Hook. & Arn. Bot. Beechy 310. 1841. non Linn.
Euphorbia anceps Benth. Bot. Voy. Sulph. 162. 1844.
Anisophyllum dioicum Kl. & Gke. Tricocc. 31. 1860.

Shrubby, tufted, diffuse, procumbent; branches compressed, long-villous except on the under surface, terete, less than 15 cm. long, hairs monocellular. Inflorescence axillary, solitary or in threes, shorter than

the leaves. Leaves opposite, pilose on both surfaces, 2–5 mm. long, oblong or ovate-oblong, unequally subcordate at the base, obtuse to acutish, the margin closely denticulate especially toward the apex; petioles 1 mm. pilose; stipules interpetiolar, subulate, 1.5 mm., pilose. Involucres pyriform-globose, peduncle bracteate, unilateral, somewhat pilose; lobes minute, lanceolate, inflexed; glands in two pairs, squamiform, cupped; appendages white, the two upper auriculiform, thrice the size of the lower flabelliform pair; stamens minute, ligulate, pilose at the base. Capsule somewhat pilose; seed triangular-ovoid, .60 x .40 mm., pinkish-ashen; facets plane; ridges evenly convex; sulci 4, closed, the two basal anastomosing; seed-coat pitted.

Type locality: Venezuela, Valles de Aragua, near Cura. Humb. Bonpl. & Kunth. Type in herb. Paris; fragment in herb. Berlin.

Distribution: From Brazil through British Guiana to the U. S. Colombia, and in our region as follows:

Nicaragua, Omotopec, *Wright* (hb. Gray; F. 409466; Mo. 39421).

Honduras, San Pedro Sula, *Thieme* 5475 (F. 197624).

Guatemala, Gualan, *Deam* 234 (F. 413605; hb. Gray). Retaluleu, *Bernoulli & Cario* 2421 (hb. Berlin).

Yucatan, *Gaumer* 629 pt. (F. 196353; Mo. 39402), 938 pt. (F. 196349, 196350, 196351, 196354; Mo. 39403; U. S. 571824), 939 pt. (Mo. 39404); Izamal, *Caec. et Ed. Seler* 3924 (F. 413598; hb. Berlin); Chichen Itza, *Millspaugh* 107 (F. 196973).

Mexico, *Orcutt* 4444 (F. 283317); Jipimeo, *Gregg* 812 (hb. Gray); Vera Cruz, *Pringle* 8477 (F. 143598, 400497; Mo. 39406; U. S. 396334; hb. Gray), *Greenman* 250 (F. 189715); Oaxaca, *Seler* 1990 (F. 413597; hb. Gray; hb. Berlin), *Conzatti & Gonzales* 1189 (F. 413603; hb. Gray); Sinaloa, *Lamb* 372 (F. 413581; hb. Berlin).

Lower California, San Blas, *Wright* 1358 (F. 166388, 267605, 409509; Mo. 39405; U. S. 22163; hb. Gray).

Santo Domingo, *Mayerhoff* (hb. Berlin).

Chamaesyce rutilis sp. nov.

Prostrate, spreading from a rather ligneous base; stems few and very short; branches compressed, woolly except on the median line beneath, divaricate, internodes long; hairs multicellular. Inflorescence solitary in the axils of the leaves or leafy bracts. Leaves slightly pilose beneath, oblong to oblong-lanceolate, 4 x 7 to 6 x 10 mm., broadest at the upper third, inaequilateral, narrowly or broadly auriculo-oblique

at the base, acute, denticulate along the longer edge and about the apex; stipules subulate, the under pair thrice the length of the upper. Involucres minute, nearly sessile by their narrowing bases, pyriform, stiff pilose especially above; lobes mere bundles of ciliae; glands as in dioica; appendages deep red, the upper pair 1.5 x .8 mm., narrowing to a blunt apex, margins irregularly repand-dentate, the lower pair flabellate. Male flower pedicels glabrous; female stiff-pilose especially above; ovary stiff-pilose, styles united at the lower third, bifurcate one-quarter their length into recurved stigmas; capsule setaceous-pilose, cocci rounded; seed triangular-ovoid, pinkish, .90 x .60 mm., acute at the apex; angles slightly corrugate; facets plane; ridges broadly convex, sulci 5, narrowed to a mere line.

Type locality: GUATEMALA, Fiscal, alt. 3700 ft., *Chas. C. Deam* 6189. Type in herb. Field Museum No. 285111. (Other sheets 274011, 279578; hb. Gray.)

Distribution: HONDURAS, *Niederlein* 179 (hb. Berlin).

Chamaesyce inaequalis (Kl. & Gke.) comb. nov.

Anisophyllum inaequale Kl. & Gke. Tricocc. 27. 1859.

Euphorbia inaequalis Klotzsch obs. in Peters Nat. Reise Mossamb. Bot. 94. 1862.

Euphorbia callitrichoides Schaur in Linn. 20:727. 1847. non Linn.

Prostrate, spreading from a slender, elongated, ligneous root; stems many from the base, compressed, pilose above and especially on the margins, glabrous beneath; branches profuse, divergent, internodes short, 4–6 mm.; branchlets alternate. Inflorescence solitary in the upper leaf axils of the branchlets and tips of the branches. Leaves ovate, 5 x 3 to 7 x 4 mm., glabrous on both surfaces, unequally cordate, more or less acute, slightly crenate-dentate; petioles 1 mm. or less, mostly glabrous; stipules slender subulate-aristate, mostly glabrous, the upper somewhat exceeding the petioles, the under twice their length. Involucres turbinate-campanulate, the outer surface minutely pilose, the inner densely woolly; lobes flabellate, ciliate; glands transversely oval, cupped, somewhat less than half the size of the appendages; appendages white, the larger (1.2 x .3 mm.) crenate-margined, the smaller (.6 x .2 mm.) erose-dentate; pedicels of the male flowers ligulate, glabrous, those of the female pilose above; ovary pilose; style trifid to the base, the branches bifid one-third their length. Capsule pyriform, pilose, cocci rounded; seed triangular-ovoid, .90 x .60 mm., pinkish; apex acute, the dorsal angle most prominent, facets plane, ridges rather broad and rounded, sulci 5, shallow but well defined, seed-coat minutely pitted.

Type locality: MEXICO, *Ehrenberg* 1034. Type in herb. Berlin.

Distribution: MEXICO, *Schaffner* 792, 797 (hb. Berlin); *Coulter* 1447c (hb. Gray); *Uhde* 1164 pt. (hb. Berlin). Oaxaca, *Nelson* 1484 (F. 413610; hb. Gray); *Conzatti & Gonzales* 435 (F. 413602; hb. Gray); *Purpus* 3423 (F. 276357, 413612; hb. Gray). Vera Cruz, *Purpus* 2318 (F. 201867; Mo. 39424; U. S. 840431; hb. Gray). Orizaba, *Mueller* 1535 pt. (F. 346508; hb. N. Y.); Puebla, *Arsène* 61=437 (F. 413571; hb. Berlin); Tacubaya, *Aschenborn* (hb. Berlin); Guanajuato, *Dugès* (F. 409498; hb. Gray); San Luis Potosi, *Schaffner* 1034 pt. (F. 409500; hb. Gray).

Chamaesyce indivisa (Engelm.) comb. nov.

Euphorbia dioica indivisa Engelm. Mex. Bd. 2:187. 1858.

Prostrate, spreading from an apparently annual root; stems many, 5–12 cm. long; branches few, divaricate, compressed, pilose above glabrous beneath. Inflorescence as in dioica but more open. Leaves ovate, 5–8 x 1.3–6 mm., glabrous or subglabrous above, slightly pilose beneath, auriculo-oblique at the base, acute, the margin few dentate-serrate especially above though sometimes appearing entire; petioles 1 mm., long-pilose; stipules subulate-setaceous, pilose. Involucres short-campanulate, the outer surface pilose, the inner glabrous; lobes broadly-deltoid, ciliate; glands transversely-oval, cupped; appendages pale-buff, the larger pair 1.7 x .8 mm., few-crenulate on the lower and outer margin, the smaller pair one-sixth the size, slightly 3-crenulate; pedicels of the male and female flowers glabrous; ovary densely pilose; styles 3, divided to the base, the stigmatic apices undivided. Capsule pyriform, pilose even in age; cocci rounded; seed triangular-ovoid, 1.00 x .60 mm., buff, the angles nearly equal and strongly tuberculate at the juncture of the ridges; facets somewhat convex; sulci 4, broad and open; seed-coat farinose.

Type locality: NEW MEXICO, Copper Mines, *Chas. Wright* 1845. Type in Gray Herbarium. Other sheets (F. 408360; U. S. 22166).

Distribution: MEXICO, *Alaman* 100910 (hb. de Candolle); San Luis Potosi, *Parry & Palmer* 816, 819 (F. 409505–7; U. S. 22169, 22173; Mo. 39420; hb. Gray); *Schaffner* 855 (F. 409499; hb. Gray), Durango, *Palmer* 878 (F. 197681, 51930; U. S. 315588; Mo. 29400; hb. Berlin); Coahuila, *Palmer* 1206 (F. 409502; U. S. 22174); Chihuahua, *Pringle* 326 (F. 104207, 197343, 262753–4; U. S. 22164; Mo. 39401); *Palmer* 381 (F. 409501; U. S. 22175; hb. Gray; hb. Berlin 326); Sonora, *Lloyd* 459 (hb. Gray); *Thurber* 963 (hb. Gray).

ARIZONA, Churricahua Mts., *Lemmon & wife* (F. 111081, 196749; U. S. 22167); Tucson, Range Reserve, *Wooton* (F. 413506; U. S. 690675); Rucker Valley, *Lemmon* (F. 196750, 196753–4, 409459;

U. S. 22167; Mo. 39414; hb. Gray); Santa Rita Forest Reserve, *Griffiths* 5954 (F. 413505; U. S. 496852); Bisbee, *Mearns* 868, 1075 (F. 413503–4; U. S. 229157, 560210); Fort Sewell, *Lemmon* (F. 409458; Mo. 39417); Fort Whipple, *Coues* (F. 288308, 409457; Mo. 39418).

New Mexico, Organ Mts., *Wooton* (F. 413507–8; U. S. 735273–5); *Wooton & Standley* (F. 413509; U. S. 564056); Black Range, *Metcalfe* 1292 (F. 187626; U. S. 498091; hb. Gray; hb. Berlin); Silver City, *Greene* 434 (F. 409464; Mo. 39413); Hillsboro, *Greene* 1292 (F. 187626; U. S. 498091).

Texas, Alpine, *Mackensen* (F. 300276); La Grange, *Schneck* (F. 373890).

Illustration: Millsp. Bot. Gaz. 26:21.

Chamaesyce adenoptera (Bertol.) Small Fl. SE. U. S. 714, 1334. 1903.

Euphorbia adenoptera Bertol. Misc. Bot. 3:20. 1843.

Euphorbia Lindeniana A. Rich. in Sagra Hist. Cub. 11:197. 1850.

Euphorbia serpyllifolia Kunth H. B. K. Nov. Gen et Sp. 2:53. 1817. non Pers.

Euphorbia pergamena Small. Bull. Torr. Club 25:615. 1898.

Anisophyllum Lindenianum Kl. & Gke. Tricocc. 33. 1859.

Chamaesyce pergamena Small Fl. SE. U. S. 713, 1333. 1903.

Euphorbia Gundlachii Urban Symbol. Antill. 5:392. 1908.

Plants rosulate, tufted, compact; root perennial, thick, nodose, short and heavy; stem prostrate, terete; branches numerous, alternate, minutely pilose laterally and above. Inflorescence solitary, upper axillary. Leaves opposite, thick, opaque, indistinctly 3-nerved, wrinkling in drying, green and subglabrous above, generally crispid-pilose beneath, ovate to fabiform, strongly inaequilateral, 6 x 2.5 to 8 x 3.5 mm., obliquely cordate at the base, obtuse, the margin obsoletely subcrenate or more or less indistinctly repand, thickened and revolute; petioles short, pilose; stipules subulate-setaceous, deciduous. Involucres subsessile, campanulate, 1–1.5 mm., including the peduncle, puberulous without and within; lobes deltoid, truncate, ciliate; glands transversely oblong, somewhat cupped; appendages petaloid, the lower pair rotund, 3-crenate, 1 x .4 mm., about twice smaller than the ascending, wing-like, sanguinate upper pair; pedicels of the male flowers glabrous, the female short-pilose above; ovary densely pilose; style trifid two-thirds its length, the branches bifid one-third. Capsule globose, whitish pubescent; cocci rounded; seed ovoid, .85 x .70 mm., ashen; apex obtuse; the angles not strongly marked; facets convex, ridges broad and rounded; sulci 3, narrow, distinct; seed-coat finely pitted.

Type locality: Santo Domingo, *Bertero*. Type in herbarium de Candolle.

Distribution: SANTO DOMINGO, Prov. Barahona, *Fuertes* (F. 385336); Constanza, *von Tuerckheim* (F. 298607; U. S. 656169).

CUBA, *Wright* 13 (F. 409467; Mo. 39410), 547 (F. 409468; Mo. 39408), 2014 (F. 409469; Mo. 39407), 2015 (F. 409470; Mo. 39408); *Linden* 1706, type of *Lindeniana* (hb. Boissier; hb. de Candolle; hb. Krug & Urban; F. 413582 comm. Urban); Pinar del Rio, *Shafer* 10702 (F. 409487; hb. N. Y. Bot. Gard); 10840 (N. Y.; F. 409489), 11093 (N. Y.; F. 409490); Santa Clara, *Cuesta* 248 (N. Y.; F. 409491); Cojimar, *Percy Wilson* 9532 (N. Y.; F. 409492), *Bro. Leon* 1931 (N. Y.; F. 409494); Isle of Pines, Pedernales Point, *Millspaugh* 1436 (F. 61436, 196921), 1442 (F. 61442, 196923), 1443 (F. 61443, 196922).

FLORIDA, Biscayne Bay, *Palmer* (F. 409504; Mo. 39411; hb. Gray), *Curtiss* (F. 409462); Miami, *Garber*, type of *pergamena* (F. 196330–1; U. S. 16179, 22171; Mo. 39416; hb. Gray); East Border of the Everglades, *Curtiss* (F. 196258–9, 259796, 308418; Mo. 39426; U. S. 22168; hb. Gray; hb. Berlin); near Cutler, *Small & Carter* (N. Y.; F. 172417, 172448, 185184); near Lemon City, *Simpson* 523 (F. 258583; U. S. 22162; hb. Gray); near Homestead, *Small & Wilson* (N. Y.; F. 172585); Sanibel Island, *Tracy* 7223 (F. 101954 badly diseased but doubtless the species).

Illustrations: Bertol. Misc. Bot. t. 23, f. 3; Boiss, Euph. Icon. t. 19.

Chamaesyce monensis sp. nov.

Perennial, lurid, prostrate from a thick, ligneous rootstalk; stem short, ligneous; branches terete, puberulous, 3–6 cm. swollen at the nodes. Inflorescence solitary, terminal and terminal-axillary. Leaves opposite, ovate to oblong-ovate, 2.5 x 2 to 4 x 3 mm., sarcous, closely crispid-puberulous, subcordate, obtuse, the margin crenulo-serrate especially on the upper half; petiole 1 mm.; stipules triangular, ciliate. Involucres subsessile, campanulate, the outer surface white-crispid-pilose, inner surface smooth with a fold or keel-like band of tissue extending from the fundus to, and projecting beyond, the base of the sulcus to form a lacerate, ciliate, fifth lobe of the involucre; lobes lanceolate, ciliate, sarcous; glands transversely oval, greenish, in two pairs, one pair twice the size of the other; appendages none; bracteoles numerous, lacerate-plumose; male and female flowers glabrous, ovary white-crispid-pilose; style pilose, trifid to near the base, the apices of the branches shortly bifid. Capsule short-pilose; seed triangular-ovoid, white, .90 x .70 mm., apex acute, angles sharp, facets plane, transversely

broad and flat ridged; sulci 4–5, tight closed, those of the dorsal facets transverse of the ventral oblique.

Type locality: West Indies, Mona Island, Ubero, on limestone plateau, *Britton, Cowell & Hess* 1841. Type in herb. Field Museum, sheet No. 413680.

Distribution: Known only from the type.

CHAMAESYCE CONFERTA Small Fl. SE. U. S. 713, 1903.

Plant spreading, prostrate, red-tinged throughout; root slender, elongated, annual; branches virgate, compressed, .5–2 dm. long, often forking, pilose above, glabrous beneath, internodes on diffuse plants 1–1.5 cm. long. Inflorescence solitary in the axils of the upper leaves or leafy bracts. Leaves approximating in pairs or, in small, dense plants and on the branchlets of diffuse ones closely ranked, lanceolate-ovate, 5–10 mm. long 3–5 mm. broad, sparsely long and straight pilose while young, glabrous in age, the base strongly oblique, sub-cordate in the larger leaves, acute, serrate; petioles short, glabrous except those of the young leaves; stipules subulate-aristate, crisp-pilose, the bases often broadened and sometimes bifurcate. Involucres sessile or nearly so, tubular-campanulate, villous without and within; lobes ligulo-deltoid, ciliate; glands narrowly-oblong, transverse, cupped; appendages small, the larger pair broader above and irregularly erose-dentate, the smaller crenate-dentate, but slightly exceeding the glands; pedicels of the male flowers glabrous, of the female villous; ovary pilose; style trifid two-thirds its length, the branches bifid one-third. Capsule ovoid-globose, minutely pilose; cocci rounded; seed ovoid, .70 x .50 mm., ashen, slightly quadrangular, obtuse, facets convex, the angles rounded, the ridges broad and convex, sulci 5, mere closed fissures, the basal pair often anastomosing; seed-coat farinose.

Type locality: Florida, Coconut Grove, *Small & Nash*. Type in herb. New York Botanical Garden; fragments in herb. Field Museum No. 197585.

Distribution: FLORIDA, Lemon City, *Hitchcock* (F. 233636); Miami, *Pollard & Collins* 229 (F. 76683, 197286; U. S. 330180; *Small & Carter* 1079 (N. Y.; F. 185172), *Curtiss* 173 (F. 409460; Mo. 39415); Coconut Grove, *Simpson* 536 (U. S. 22161), *Curtiss* 5486 (F. 409461; U. S. 247194; Mo. 39298); Biscayne Bay, *Curtiss* (F. 109189, 308419, 23190; U. S. 22172; Mo. 39425; hb. Gray; hb. Berlin); Long Prairie, *Britton* 211 (N. Y.; F. 172783); between Homestead and Camp Jackson, *Small & Wilson* (N. Y.; F. 172583); Jenkins to Everglades, *Eaton* 206 (F. 230855).

Chamaesyce densiflora (Klotzsch) comb. nov.

Euphorbia densiflora Klotzsch obs. in Peters Nat. Reise Mossamb. Bot. 94. 1862.

Anisophyllum densiflorum Kl. & Gke. Tricocc. 28. 1859.

Euphorbia adenoptera Boiss. D. C. Prodr. 15:49. 1860. non Bertol.

Plants prostrate, spreading from a woody base; root rather thick, ligneous; rootstalk nodose; stems many, compressed, simple or branching; branches divaricate, pilose on both surfaces but shorter on the ridged upper side, densely leafy bracted on the branchlets. Inflorescence axillary, glomerately crowded in ranks at the ends of the branches and along the leafy branchlets. Leaves oblong to ovate-oblong, 1–1.5 x .5–1 cm., more or less falcate, finely and shortly crispid-pilose on both surfaces, the old ones sometimes glabrous above, strongly unequal, the base auriculo-cordate, the apex rounded or sub-truncate, margin finely denticulate especially toward the apex; petioles very short, one-tenth the length of the blade, villous or glabrate; stipules subulate-aristate, always recurved, often unequally bifid at the base, slightly and minutely pilose. Involucres campanulate, outer surface pilose; lobes broad fimbriate, ciliate; glands large, plane, not cupped, somewhat smaller than the appendages, the larger pair reniform, the smaller oval; appendages white, pilose often on both surfaces, the hairs longest on the under, outer margin erose-dentate; pedicels of the male flowers glabrous, of the female pilose above, male flowers frequently all aborted in those involucres bearing female flowers and vice versa; ovary densely pilose; style tripartite two-thirds the branches bifid half their length. Capsule densely short-pilose even in age; seed ovoid, slightly quadrangular, .85 x .60 mm., pinkish, obtuse; facets convex; ridges broad, the lower pair generally more or less anastomosing; sulci 6, narrowed to mere deep lines; seed-coat minutely pitted.

Type locality: Mexico, Papantla *Schiede*. Type in herb. Berlin. (A sheet in herb. Kew bears a branch of the type plant and the *Skinner* specimen from Guatemala, both determined, in Klotzsch's handwriting, *Euphorbia densiflora*.)

Distribution: Canal Zone, *Pittier* 2848 (hb. Berlin).

Nicaragua, in Monte Masaya; in Monte Candelaria; in Monte El Viejo and in San Jose, *Oersted* (hb. Berlin).

Costa Rica, San Francisco de Guadalupe, *Tonduz* 7245 (F. 413500; U. S. 471734); Cañas Gordas, *Pittier* 11083 (F. 413499; U. S. 392010); in Monte Irasu, *Oersted* (hb. Berlin).

Guatemala, *Skinner* (hb. Kew); Santa Rosa, Jumaytepec, *Heyde & Lux* 4569 (F. 264921); Baja Verapaz, San Augustine,

Kellerman 7617 (F. 224524, 224561); Zacapa, Gualan, *Kellerman* 5666 (F. 413498; U. S. 578730); Barranca de Incienso, *Bernoulli* 222 (F. 413497; hb. N. Y.; hb. Berlin).

MEXICO, Oaxaca, *Conzatti* 834 (F. 413601; hb. Gray); *Franco* (hb. Boissier); *Purpus* 6949 (F. not yet organized). Puebla, Maltrata, *Kerber* 244 (hb. Berlin). Hidalgo, Atotonilco el Grande, *Ehrenberg* 810 (hb. Berlin). Vera Cruz, *Mueller* 241 pt. (F. 346505; hb. N. Y.); Huasteca, Wartenberg, Tantoy, *Ervendberg* 251 (hb. Gray). Morelos, Cuernavaca, Xochiceles, *Cacec. et Ed. Seler* 371 (hb. Berlin). Jalisco, Barranca de Oblatos, *Barnes & Land* 204 (F. 247416, 356937); San Pedro, *Mrs. Sheldon* (F. 354642; hb. Gray); Rio Blanco, *Palmer* 567 (F. 413501; U. S. 22605; hb. Gray). Guadalajara, La Barranca, *Safford* 1431 (F. 413502; U. S. 573426); *Pringle* 11847 (F. 413611; hb. Gray); *Gregg* 862 (F. 413608; hb. Gray). Without locality, *Orcutt* 2894 (F. 279025); 4682 (F. 283459).

EXTRALIMITAL

Chamaesyce amoena (Klotzsch) comb. nov.

Euphorbia amoena Klotzsch in Schomb. Faun. et Fl. Br. Guiana 1184. 1848.

Anisophyllum amoenum Kl. & Gke. Tricocc. 33. 1859.

There is a part specimen of this British Guianian species in the herbarium at Kew, labeled "Ehrenberg, Mexico," that is such a perfect counterpart, in size, form, and color of drying, of a part specimen in the same herbarium, and in herb. Berlin as well, labeled "Schomburgk, Guian. Angl." that I am quite certain of error in the labeling of the former; especially as there is no Ehrenberg sheet in herb. Berlin and because the Kew specimen is labeled "*Euphorbia graminea L.*" written by the same hand as the "Ehrenberg, Mexico." No one would for a moment consider the plant to be that species. A mixture doubtless occurred in the mounting of the Kew sheet.

2. CHAMAESYCEÆ NOVAE

Chamaesyce camaguayensis sp. nov.

Plants glabrous, densely tufted from a heavy, deep rootstalk; root perennial; stems rosulate, 6–10 cm., slender, wiry, internodes long. Inflorescence terminal, solitary in the upper axils. Leaves oval, 2.5–

3.5 x 1.5–2.5 mm., mostly reddish, strongly inaequilateral, subcordate, obtuse, entire; petioles 1.5 mm.; stipules: the upper elongated-triangular, more or less lacerate or bi-acicular, the lower short-triangular, the margin lacerate-dentate. Involucres turbinate, peduncle nearly the length of the tube, tube glabrous without, densely ciliated at the throat within; lobes triangular, ciliate; sulcus with an acicular, fimbriate lobe at the fundus; glands plane, reniform; appendages showy, white or roseate, oval, entire; bracteoles many, ligulate, finely fimbriate; pedicels of the male flowers ligulate, anthers centrally fixed to the apex of the pedicel; style trifid to the base, the branches bifid, stimgatic surface large, half the length of the style. Capsule glabrous, cocci strongly angled, glabrous; seed pink, farinose, ovoid-triangular, .8 x .6 mm., obtuse, the dorsal angle strongest, dorsal facets slightly marked by indefinite ridges.

Type locality: Cuba, in savannas near Camaguey, April, 1912, *N. L. & E. G. Britton & J. F. Cowell* 13233. Type in herb. New York Botanical Garden; fragmentary portions in herb. Field Museum No. 409482.

Distribution: Cuba, vicinity of El Morro, Santiago Bay, *Britton & Cowell* 12537; Camaguey to Santayana, *Britton* 2394.

Chamaesyce paredonensis sp. nov.

Perennial from a heavy, thick, ligneous root; plants in dense, prostrate masses, crispid-pilose; stems vastly numerous, many times divaricately branching; branches tenuous. Inflorescence solitary in the forks of the upper branchlets. Leaves minute, 2–4 x 1–2 mm., opposite, oblong, fleshy, inaequilateral, scattered pilose above and beneath, subcordate, obtuse, margins of the terminal leaves entire, those of the median and lower leaves irregularly and unequally few crenate-dentate; petioles 1 mm. or less, interpetiolar, bulbous-triangular, bi or tri-aristate, pilose. Involucres campanulate, about the length of the pedicels, glabrous, the inner surface woolly except at the fundus; lobes broadly-triangular, ciliate; sulcus broad and not demarked from the general margin; glands transverse, oval; appendages white, ovate, slightly emarginate, about twice the breadth of the glands; male flowers few, the pedicels ligulate, glabrous, female pedicel and ovary glabrous; style trifid, spreading, the stigmatic lobes bifid two-thirds. Capsule glabrous; seed triangular-ovoid, greenish-white, 1.2 x .8 mm., acute, the dorsal angle very sharp, the facets smooth, the two ventral about equal to one dorsal.

Type locality: Cuba, Cayo Paredon, *J. A. Shafer* 2763, October 25, 1909. Type in herb. New York Botanical Garden; fragments and co-types in herb. Field Museum sheets 409486 and 286093.

Near **Chamaesyce portoricensis** (Urban) comb. nov. (*Euphorbia portoricensis* Urban Symb. Antill. 1:338. 1899). Our species differs strongly in its oblong, mostly crenate-dentate leaves, involucral teeth and appendages, and larger, smooth, triangular seeds.

Chamaesyce anegadensis sp. nov.

Annual from a wiry root; plants short-stemmed, prostrate, rosulate-spreading, densely white-villous; branches tenuous, short, 2–5 cm. Inflorescence solitary, terminal in the bifurcations and axils. Leaves opposite, thick, suborbicular, 3–6 mm. long, pilose on both surfaces, base strongly oblique-cordate, apex obtuse, margin entire, revolute; petioles short, about 1 mm.; stipules deltoid, densely ciliate-margined. Involucres turbinate, pilose without and within, pedicel about the length of the tube, lobes broadly deltoid, tufted-ciliate, sulcus V-shaped, ciliate; glands transverse, oval, green; appendages sarcous, white or pinkish, about the width of the glands, margin entire, ciliate; bracteoles tomentose; pedicels of the male flowers ciliate, of the female glabrous below and woolly above; ovary densely woolly; styles distinct, short, bifid to the base or nearly so. Capsule ovoid, long white-pilose even in age; seed ovoid-triangular, acute, .9 x .6 mm., pinkish, the coat cellulo-farinose; angles strong and sharply defined; facets smooth, convex.

Type locality: Anegada, Dutch West Indies, *N. L. Britton & W. C. Fishback* 998, February 19–20, 1913. Type in herb. Field Museum, sheet No. 408241.

Near Ch. portoricensis (above) from which it differs specifically in its long-hairiness; thicker, larger, suborbicular leaves, short petioles, entire stipules and its triangular smooth seeds.

Chamaesyce nirurioides sp. nov.

Annual; plants low, glabrous, erect or ascending; stem red, ligneous, terete; branches alternate, 5–10 cm. Inflorescence solitary in the terminal bifurcation and the axils of the upper leaves. Leaves opposite, appressed, obovate, 3-nerved, oblique at the base, obtuse, margin serrate-dentate especially at the upper third; petioles 1 mm. Stipules interpetiolar, deltoid, thick, the margins glandular punctate. Involucres long-pedicellate, campanulate, glabrous without and within; lobes elongated triangular, few ciliate at the apex; glands waxen, orbicular, cupped; appendages white or pink, orbicular, thrice the diameter of the glands, entire or mostly so; male flowers glabrous; female pedicel and ovary glabrous: Style trifid to the base, the branches bifid one-half their length; capsule glabrous, tricoccous, cocci rounded; seeds triangular-ovoid, 1 x .8 mm., blackish with yellowish angles, apex acute,

the hilum distinct, facets convex, marked by a few indistinct and incomplete ridges.

Near *Chamaesyce brasiliensis* from which it is readily distinguished by its yellowish seed angles, glandular-dotted stipules, and a striking resemblance in habit to Phyllanthus Niruri.

Type locality: Jamaica, in a pasture at Malvern, *N. L. Britton* 1186. Type in herb. Field Museum, sheet No. 217319.

Distribution: Known only from the type.

Chamaesyce insulaesalis sp. nov.

Perennial, erect, 7–10 cm. from a densely nodular rootstalk; branches densely tufted, wiry, terete, glabrous, internodes 1.5–2 cm. Inflorescence solitary, terminal and terminal-axillary. Leaves opposite, sarcous, glabrous, 2–4 x 1.5–3 mm., ovate, inaequilateral, marked only by the thick midrib, subcordate, acute, the margin entire or in the lowermost indistinctly and minutely denticulate; petioles about 1 mm., often with a tuft of ciliae between the base and the stipule; stipules of many forms from deltoid and entire through lanceolate, bifid, and lanceo-aristate to a mere tuft of ciliae. Involucres campanulate, sessile or nearly so, the outer surface smooth, the inner densely woolly, the wool especially long and dense at the fauces; lobes triangulo-aristate, densely woolly on the inner, recurved surface; glands transverse, oval; appendages greenish-white, entire or nearly so, about as broad as the glands; bracteoles dense tufts of woolly hairs; male and female flowers glabrous; style trifid to the base, the branches bifid to half their length. Capsule glabrous, strongly tricoccous; seed 1 x .7 mm. triangulo-ovate, white, acute at the apex, the angles sharp, the facets smooth or nearly so, some marked by a few irregular, low and indistinct ridges.

Type locality: Bahamas, Salt Key Bank, Salt Key, in sandy places, *Percy Wilson* 8082. Type in herb. Field Museum, sheet No. 246476.

Distribution: Known only from the type.

3. NOTULAE HYPERICIFOLIÆARUM.

Chamaesyce hypericifolia (Linn. Sp. Pl., 454. 1753); Millsp. Field Col. Mus. Bot., 2:302, 1909.

The reference to this species in Gray's Manual from the first to the fifth edition should have been to *C. Preslii* Guss. *C. hypericifolia* is tropical and sub-tropical, its distribution extending from the southern

coast of the Caribbean Sea to Miami, Florida, and central Mexico, the Bahamas and Bermuda. The references to *C. nutans* in manuals and lists of Northern American plants is plainly a misinterpretation of species; *C. nutans* is sub-tropical and is readily differentiated from *C. hypericifolia* by its inflorescence, being single in the axils of the upper leaves instead of glomerulate as in C. HYPERICIFOLIA. Seeds brownish-red, .8 x .6 mm., manifestly tetrangular, the ventral facets not ridged.

CHAMAESYCE RAFINESQUEI (Greene) Heller in Muhlenbergia 8:48. 1912.

Euphorbia Rafinesquii Greene, Pittonia, 3:207. 1897.

Euphorbia hypericifolia hirsuta Torrey Fl. N. Y. & Mid. States 331. 1826.

Euphorbia hirsuta Wiegand Bot. Gaz. 24:50. 1897. non Schur. nec Kit.

The long hairs on the stems of this species immediately distinguish it. It differs strongly in the involucre from its nearest cogeners in having all the lobes lacerate and of equal size. The appendages are transversely ovate and irregularly repand. The capsules are glabrous, the cocci but slightly keeled and the seeds oblong, brown, 1.2 x .8 mm. rather sharply angled upon the dorsum, the facets but slightly rugose.
Type locality: NEW YORK, campus of Cornell University at Ithaca, *K. M. Wiegand.* Type in herb. Cornell University.
Distribution: From ONTARIO southward through NEW YORK and southwest through OHIO, INDIANA, and ILLINOIS to ARIZONA.

CHAMAESYCE NUTANS (Lag.) Small, Fl. SE. U. S., 712. 1903.

Euphorbia nutans Lagasca, Gen. et Sp. Nov., 17. 1816.

The inflorescence, solitary in the upper and middle leaf-axils, and the small leaves, at once distinguishes this glabrous species from its cogeners. The involucral walls show almost equal, substantially 3-fingered, lobes with a similar process at the base of the sulcus. The glandular appendages are very rudimentary being little more than a ridge on the dorsum of the gland. The seeds are elongated-ovate, 1.3 x .9 mm., very dark red with an ashen covering, the transverse rugae of the dorsal facets more prominent than those of *C. Preslii.*
Distribution: MEXICO, near Durango and Vera Cruz.

Chamaesyce rubida (Greenm.) comb. nov.

Euphoriba rubida Greenm. in Proc. Am. Acad., 39:83. 1903.

The differentiating macroscopic characters of this species lie substantially in its capsules and seeds. Its affinity is between *nutans* Lag.

and *Rafinesquii* Greene, differing from the former in being hairy and from the latter in having hairy capsules. The roseate involucres are very hairy within, glabrous or nearly so without; the lobes are equal, triangular and entire, the pair flanking the sulcus not larger nor differing from the other three; the sulcus shallow with a small, ligulate tooth rising from its fundus. Capsules hairy, the cocci scarcely keeled. Seeds ovoid, 1 x .7 mm. olive, or whitish-olive, the outer coat minutely punctate, more or less quadrangular, the dorsal and lateral angles markedly distinct, the slight anastomosing ridges of the facets hardly distinguishable.

Type locality: Mexico, from dry ledges in Tultenango Cañon, State of Mexico, October 9, 1902, *C. G. Pringle* 8673. Type in herb. Gray, Cambridge, Mass.

Distribution: Known only from the type.

Chamaesyce lasiocarpa (Klotzsch) Arthur, in Torreya, 11:260. 1911.

Euphorbia lasiocarpa Klotzsch Nov. Act. Nat. Cur., xix suppl: 414. 1843.

This species is readily distinguished from other *hypericifoliae* by its cinereous appearance; general short-hairy pubescence; long internodes and the more distinctly ridged facets of the obtuse-angled, brownish-red to ashen, elongated-ovate seeds (1.1 mm. long, .7 mm. broad). The involucral sulcus is unoccupied, the lobes entire and the appendages of the glands heterogeneous.

Distribution: Jamaica and Central America to Florida and northern Mexico.

Chamaesyce hyssopifolia (Linn.) Small Bull. N. Y. Bot. Gard. 3:429. 1905.

Euphorbia hyssopifolia Linn. Syst. ed. 2,10:1048. 1759.

The characters of this plant are strongly specific. The plant hardly belongs under *C. brasiliensis* (*Euphorbia brasiliensis hyssopifolia* Boiss.) being distinct with its oblong, blunt, almost ligulate leaves mostly entire though sometimes sparingly toothed; its large, white, seldom entire appendages; and olivaceous, ovoid seeds upon the facets of which the transverse ridges are very inconspicuous.

Distribution: The Greater Antillean Islands and Central America.

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